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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,640	03/28/2001	Atsushi Koike	35.C15222	2483

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EXAMINER	
FULLER, ERIC B	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 10/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/818,640	KOIKE ET AL.	
	Examiner	Art Unit	
	Eric B Fuller	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-6,9-13 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-6,9-13 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Observations

It is noted that claims 14-26 were canceled by the amendment filed February 19, 2003. The status of these claims indicated by the applicant in the current amendment is incorrect. Additionally, it was requested that the examiner consider rejoining these claims if the other claims where deemed allowable. This is not possible, as these claims have been cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3-6, 11-13, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burger et al. (WO 98/58100).

Burger teaches a process of supplying a hydrogen gas and a raw material gas for forming a film that comprises at least an Si element (page 5, lines 23-30). High frequency electric power into the discharge electrode may create the plasma (page 3, lines 25-30). The substrate holder, which acts as an auxiliary electrode by producing a substrate bias, is supplied with a frequency that overlaps the applicant's claimed range (page 8, lines 10-15). This auxiliary electrode (figure 1, reference 11) is placed in the

vacuum chamber and makes contact with the bottom of the substrate. Since the plasma uniformly coats the substrate by ion bombardment (column 1, lines 60-65), the plasma must inherently contact the area in which the substrate holder holds the substrate. Taking this into consideration, the substrate holder (auxiliary electrode) reads on being "in plasma". Additionally, the substrates themselves, being electrically coupled to the voltage supply (column 4, lines 35-45), read on being auxiliary electrodes. Taking this interpretation into consideration, the electrode certainly is "in plasma". The voltage may be pulsed unipolar or bipolar (page 8, lines 25-30). Depending on the polarity of the voltage, which the reference allows for either or both, the ions and/or electrons are excited in order to control the generation of hydrogen radicals and ion bombardment (paragraph bridging pages 10 and 11). The reference fails to teach the frequency of the high frequency electric power supplied to the discharge electrode. However, it is the position of the examiner that since the reference teaches to use a high frequency power source, to use frequencies within the applicant's broad range of 1MHz to 200MHz would have been obvious at the time the invention was made to a person having ordinary skill in the art with the expectation of success, as these values are considered to be high frequencies. Additionally, the reference fails to teach the maximum amplitude of the bias voltage.

However, the reference does teach that there is a cause and effect relationship between the magnitude of the voltage and the hardness of the deposited layer (page 14, lines 4-6). Therefore, it would have been obvious, and within the skill of one

practicing in the art, to use voltages that give the desired hardness of the deposited layer.

Additionally, to claim 6, although the reference teaches a single electrode (11) that acts as a substrate holder for multiple substrates, one skilled in the art would recognize the equivalence of multiple electrodes each holding a single substrate. To do this would be a mere duplication of parts, which has been held obvious by the courts. *St. Regis Paper Co. v. Beemis Co. Inc.* 193 USPQ 8, 11 (1977); *In re Harza* 124 USPQ 378 (CCPA 1960).

As to claim 27, the interpretation of the substrates being analogous to the auxiliary electrodes, reads on the limitation of this claim.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burger et al. (WO 98/58100), as applied to claim 1 above, and further in view of Raoux et al. (US 6,162,709).

Burger teaches the limitations of claim 1, as shown above, but fails to explicitly teach the shape of the electrode. However, Raoux teaches a process where a pulsed voltage bias is applied to a substrate by an electrode that is embedded in the substrate holder and comprises a nickel rod that has a small diameter and a small area facing the substrate (column 8, lines 40-50). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use the embedded electrode of Raoux in the process taught by Burger with the expectation of achieving similar results, as both reference act to supply a pulsed voltage bias to a substrate.

Response to Arguments

Applicant argues that Burger fails to teach that the auxiliary electrode in "in plasma". This is not found convincing. As discussed above, the substrate holder may read on being an auxiliary electrode. Also, the substrates themselves, being electrically coupled to the voltage source, may read on being an auxiliary electrode. Since the plasma uniformly coats the substrate by ion bombardment (column 1, lines 60-65), the plasma must inherently contact the area in which the substrate holder holds the substrate. Taking this into consideration, the substrate holder and/or the substrates read on being "in plasma".

Applicant argues that Burger teaches that the substrate holder is outside the plasma. Support for this argument is not found in the reference. The only indication that this might be taught is found in the figures. However, there is no indication that the figures are drawn to scale. The explicit teaching of uniform coatings is more persuasive than the drawings. Therefore, the applicant's arguments are unconvincing, especially in view of the interpretation that the substrates themselves read on being auxiliary electrodes.

Applicant argues that the preferred range of biasing frequency taught by Burger is outside of the applicant's claimed range. This argument is not found convincing. Burger explicitly teaches to use frequencies that are in the applicant's range. Therefore, regardless of preference, the reference anticipates this limitation.

Applicant argues that using multiple electrodes results in unexpected results. This is not convincing. One of ordinary skill in the art would expect that since it is taught that one electrode provides more uniformity than having none, having multiple electrodes would provide even more uniformity.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers

for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

EBF
October 1, 2003

TIMOTHY MEEKS
PRIMARY EXAMINER